

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Shubhen Kapila, et al.	Examiner: Not Yet Assigned
Serial No. Not Yet Assigned	Group Art Unit: Not Yet Assigned
Filed: Herewith	
For: Solvent and Method for Extraction of Triglyceride Rich Oil	

PRELIMINARY AMENDMENT

Box: Patent Application
Commissioner For Patents
Washington, DC 20231

Sir:

In connection with the Divisional application of Application Serial No.
09/491,185 being filed herewith, please amend the application as follows and consider
the following remarks.

CERTIFICATE UNDER 37 C.F.R. § 1.8 and § 1.10

I hereby certify that, on the date shown below, this correspondence is being

- ☒ deposited with the United States Postal Service in an envelope addressed to Box: Patent Application, Commissioner for Patents, Washington, D.C. 20231 with sufficient postage:

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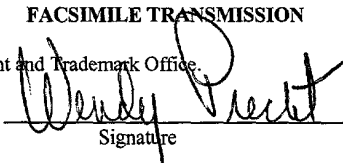
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Wendy Precht

Name of Depositor



Signature

February 21, 2002

Date

IN THE SPECIFICATION

Please amend the specification as follows:

On page 1, between the Title and the subheading FIELD OF INVENTION insert the following new paragraph:

---CROSS REFERENCE TO RELATED APPLICATION

This application is a divisional application which claims the priority of prior application serial number 09/491,185, entitled "Solvent and Method for Extraction of Triglyceride Rich Oil", filed January 25, 2000.---

IN THE CLAIMS

Please amend the following claims:

17. (Once amended) A method of using a fluorocarbon or chlorocarbon to extract oil from an oil bearing material, said method comprising:
- (a) contacting the oil bearing material with an amount of a fluorocarbon or chlorocarbon solvent to form a miscella whereby the oil is miscible in said solvent, wherein said fluorocarbon or said chlorocarbon solvent is comprised of a hydrocarbon and said fluorocarbon or said chlorocarbon, with said fluorocarbon or said chlorocarbon added in an amount sufficient to cause said solvent to have a polarity equal to or less than 0;
 - (b) separating said miscella from the oil bearing material;
 - (c) cooling said miscella to a temperature sufficient to form distinct oil and solvent layers; and,
 - (d) treating said layers so as to separate said oil from said solvent;
- wherein said chlorocarbon is selected from compounds having the formula $C_nH_{(2n+2)-x}Cl_x$, where n equals between 1-4, and x equals between 1-9.

18. (Once amended) The method of claim 17 wherein said fluorocarbon is selected from the group consisting of $C_nH_{(2n+2)-x}F_x$, where n equals between 4-8 and x equals between 1-17; $C_nF_{(2n+2)}$, where n equals between 5-8; $C_nCl_{(2n+2)-x}F_x$, where n equals between 1-6 and x equals between 1-13; and $C_nH_{(2n+2)-(x+f)}Cl_xF_f$, where n equals between 1-4, x equals between 1-9, and f equals between 1-9; and, wherein said chlorocarbon is selected from the group consisting of CH_2Cl_2 , $C_2H_3Cl_3$, and C_2HCl_3 .

23. (Once amended) A method for extracting oil from an oil bearing material so as to form an oil product comprised of greater than 95% triglycerides and other non-polar constituents, said method comprising:

- (a) forming a solvent comprised of an amount of a low molecular weight hydrocarbon having a viscosity of less than 2.6 centipoise and a non-polar fluorocarbon or chlorocarbon, with said solvent having a polarity no greater than about 0 and a viscosity ranging between about 0.3 and about 2.6 centipoise;
- (b) contacting said solvent with the oil bearing material at a temperature sufficient so that the triglycerides and the other non-polar constituents will be miscible in said solvent, for a time sufficient to extract an amount of oil found in the oil bearing material, thereby forming a miscella;
- (c) separating said miscella from the oil bearing material;
- (d) cooling said solvent and oil composition to a temperature sufficient to form distinct oil and solvent layers; and,
- (e) separating said oil from said solvent;

wherein said chlorocarbon is selected from compounds having the formula $C_nH_{(2n+2)-x}Cl_x$, where n equals between 1-4, and x equals between 1-9.

24. (Once amended) The method of claim 23 wherein said fluorocarbon is selected from the group consisting of $C_nH_{(2n+2)-x}F_x$, where n equals between 4-8 and x equals between 1-17; $C_nF_{(2n+2)}$, where n equals between 5-8; $C_nCl_{(2n+2)-x}F_x$, where n equals between 1-6 and x equals between 1-13; and $C_nH_{(2n+2)-(x+f)}Cl_xF_f$, where n equals

between 1-4, x equals between 1-9, and f equals between 1-9; and, wherein said chlorocarbon is selected from the group consisting of CH_2Cl_2 , $\text{C}_2\text{H}_3\text{Cl}_3$, and C_2HCl_3 .

Please cancel claims 1-16 without prejudice.

Please add the following new claims.

31. (New) A composition comprising (a) a solvent and (b) a triglyceride mixture;

wherein said triglyceride mixture is extracted from an oil bearing material by said solvent, and said triglyceride mixture comprising greater than 95% by weight triglycerides and other non-polar constituents;

wherein said solvent comprises i) an amount of a low molecular weight hydrocarbon having a viscosity of less than 2.6 centipoise; and ii) a fluorocarbon solvent or a chlorocarbon solvent, said solvent having a polarity no greater than about 0 and a viscosity ranging between about 0.3 centipoise and about 2.6 centipoise, and wherein said chlorocarbon is selected from compounds having the formula $\text{C}_n\text{H}_{(2n+2)-x}\text{Cl}_x$, where n equals between 1-4, and x equals between 1-9;

whereby said triglyceride mixture is miscible in said solvent at a temperature ranging between 35 °C to 55 °C, and said triglyceride mixture and said solvent phase separate at a temperature ranging between about 15 °C and about 25 °C forming distinct solvent and oil layers that can be separated.

32. (New) The composition of claim 31 wherein said fluorocarbon is selected from the group consisting of $\text{C}_n\text{H}_{(2n+2)-x}\text{F}_x$, where n equals between 4-8 and x equals between 1-17; $\text{C}_n\text{F}_{(2n+2)}$, where n equals between 5-8; $\text{C}_n\text{Cl}_{(2n+2)-x}\text{F}_x$, where n equals between 1-6 and x equals between 1-13; and $\text{C}_n\text{H}_{(2n+2)-(x+f)}\text{Cl}_x\text{F}_f$, where n equals between 1-4, x equals between 1-9, and f equals between 1-9; and, wherein said chlorocarbon is selected from the group consisting of CH_2Cl_2 , $\text{C}_2\text{H}_3\text{Cl}_3$, and C_2HCl_3 .

REMARKS

Claims 17, 18, 23 and 24 have been amended and new claims 31 and 32 added to more particularly claim Applicant's invention. Claims 17, 18, 23 and 24 have been amended to more particularly claim the halogenated hydrocarbon of Applicant's invention. Support for the amendment to claims 17, 18, 23 and 24 can be found in the specification of the exemplary fluorocarbons and chlorocarbons at least at page 17, lines 10-20. Support for new claims 31 and 32 can be found in the specification at least at page 8, line 17 to page 9, line 6, page 10, lines 11-15, and page 17, lines 10-20. No new matter is introduced by any of the amendments to claims 17, 18, 23 or 24, or by new claims 31-32. Claims 17-32 are currently in the application for examination.

It is respectfully requested that claims 17-32 be found allowable.

Should the Examiner believe that issues remain outstanding, the Examiner is respectfully requested to call Applicants' undersigned attorney in an effort to resolve such issues and advance this application to issue.

Respectfully submitted,

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Marked-up Version of Amended Claims

17. (Once amended) A method of using a fluorocarbon or chlorocarbon to extract oil from an oil bearing material, said method comprising:

(a) contacting the oil bearing material with an amount of a fluorocarbon or chlorocarbon solvent to form a miscella whereby the oil is miscible in said solvent, wherein said fluorocarbon or said chlorocarbon solvent is comprised of a hydrocarbon and said fluorocarbon or said chlorocarbon, with said fluorocarbon or said chlorocarbon added in an amount sufficient to cause said solvent to have a polarity equal to or less than 0;

(b) separating said miscella from the oil bearing material;

(c) cooling said miscella to a temperature sufficient to form distinct oil and solvent layers; and,

(d) treating said layers so as to separate said oil from said solvent;

wherein said chlorocarbon is selected from compounds having the formula $C_nH_{(2n+2)-x}Cl_x$, where n equals between 1-4, and x equals between 1-9.

18. (Once amended) The method of claim 17 wherein said fluorocarbon is selected from the group consisting of [a formula equal to] $C_nH_{(2n+2)-x}F_x$, where n equals between 4-8 and x equals between 1-17; $C_nF_{(2n+2)}$, where n equals between 5-8; $C_nCl_{(2n+2)-x}F_x$, where n equals between 1-6 and x equals between 1-13; and $C_nH_{(2n+2)-(x+f)}Cl_xF_f$, where n equals between 1-4, x equals between 1-9, and f equals between 1-9; and, [$C_nH_{(2n+2)-x}Cl_x$, where n equals between 1-4, and x equals between 1-9] wherein said chlorocarbon is selected from the group consisting of CH_2Cl_2 , $C_2H_3Cl_3$, and C_2HCl_3 .

23. (Once amended) A method for extracting oil from an oil bearing material so as to form an oil product comprised of greater than 95% triglycerides and other non-polar constituents, said method comprising:

(a) forming a solvent comprised of an amount of a low molecular weight hydrocarbon having a viscosity of less than 2.6 centipoise and a non-polar

fluorocarbon or chlorocarbon, with said solvent having a polarity no greater than about 0 and a viscosity ranging between about 0.3 and about 2.6 centipoise;

(b) contacting said solvent with the oil bearing material at a temperature sufficient so that the triglycerides and the other non-polar constituents will be miscible in said solvent, for a time sufficient to extract an amount of oil found in the oil bearing material, thereby forming a miscella;

(c) separating said miscella from the oil bearing material;

(d) cooling said solvent and oil composition to a temperature sufficient to form distinct oil and solvent layers; and,

(e) separating said oil from said solvent;

wherein said chlorocarbon is selected from compounds having the formula $C_nH_{(2n+2)-x}Cl_x$, where n equals between 1-4, and x equals between 1-9.

24. (Once amended) The method of claim 23 wherein said fluorocarbon is selected from the group consisting of $C_nH_{(2n+2)-x}F_x$, where n equals between 4-8 and x equals between 1-17; $C_nF_{(2n+2)}$, where n equals between 5-8; $C_nCl_{(2n+2)-x}F_x$, where n equals between 1-6 and x equals between 1-13; and $C_nH_{(2n+2)-(x+f)}Cl_xF_f$, where n equals between 1-4, x equals between 1-9, and f equals between 1-9; and, wherein said chlorocarbon is selected from the group consisting of CH_2Cl_2 , $C_2H_3Cl_3$, and C_2HCl_3 [$C_nH_{(2n+2)-x}Cl_x$, where n equals between 1-4, and x equals between 1-9].